What is claimed

1. A variable geometry turbocharger assembly comprising:

a turbine housing having an exhaust gas inlet and an outlet, a volute connected to the inlet, and a nozzle wall adjacent the volute;

a turbine wheel carried within the turbine housing and attached to a shaft;

a plurality of vanes disposed within the turbine housing between the exhaust gas inlet and turbine wheel, each vane comprising:

an inner airfoil surface oriented adjacent the turbine wheel;

an outer airfoil surface oriented opposite and parallel to the inner airfoil surface;

first and second axial surfaces each positioned perpendicular to and interposed between the inner and outer airfoil surfaces;

a leading edge positioned along a first inner and outer airfoil surface junction;

a trailing edge positioned along a second inner and outer airfoil surface junction;

wherein at least one of the first and second axial surfaces comprises a composite construction of a solid section that occupies at least 25 percent of the axial surface area and that extends from the leading edge towards the trailing edge, and a cored-out section that extends a distance from the trailing edge towards the leading edge.

2. The assembly as recited in claim 1 wherein the first and second axial surface each comprise the composite construction, and wherein the solid section of the first axial surface is positioned opposite from the core-out section of the second axial surface.

3. The assembly as recited in claim 1 wherein each vane further comprises an opening within at least one of the first and second axial surfaces for accommodating a post, and wherein the solid section extends from the leading edge to the opening, and the cored-out section extends from the hole to a position adjacent the trailing edge.

4. The assembly as recited in claim 1 wherein the solid section occupies greater than 50 percent of the surface area of the first axial surface.

5. The assembly as recited in claim 1 further comprising a tab projecting outwardly from the solid section and positioned adjacent the leading edge.

6. The assembly as recited in claim 3 wherein the opening extends through the vane from the first axial surface to the second axial service, wherein the first axial surface comprises the solid section extending from the leading edge to the opening, and the cored-out section extending from the opening to a position adjacent the tailing edge, and wherein the second axial surface comprises the cored-out section extending from the leading edge to the opening, and the solid section extending from the opening to the trailing edge.

7. The assembly as recited in claim 6 wherein the first axial surface solid section occupies a major surface area of the first axial surface, and the second axial surface cored-out section occupies a major surface area of the second axial surface.

8. The assembly as recited in claim 6 further comprising a tab projecting outwardly from the first axial surface and positioned adjacent the leading edge.

9. A variable geometry turbocharger assembly comprising:

a turbine housing having an exhaust gas inlet and an outlet, a volute connected to the inlet, and a nozzle wall adjacent the volute;

a turbine wheel carried within the turbine housing and attached to a shaft;

a plurality of vanes disposed within the turbine housing between the exhaust gas inlet and turbine wheel, each vane comprising:

an inner airfoil surface oriented adjacent the turbine wheel;

an outer airfoil surface oriented opposite and parallel to the inner airfoil surface;

first and second axial surfaces perpendicular to and interposed between the inner and outer airfoil surfaces, wherein the second axial surface is positioned adjacent the nozzle wall;

a leading edge positioned along a first inner and outer airfoil surface junction;

a trailing edge positioned along a second inner and outer airfoil surface junction;

an opening disposed through the second axial surface for accommodating a post therein that is interposed between the vane and the nozzle wall; and

actuating means positioned on the first axial surface;

an annular unison ring positioned adjacent the vanes along the first axial surface and comprising means for cooperating with the actuating means to engage the plurality of vanes to rotate the vanes within the turbocharger;

wherein at least one of the first and second axial surfaces comprises a composite construction of a solid section and a cored-out section, wherein the solid section occupies at least 25 percent of surface area of the vane axial surface extending from the leading edge towards the trailing edge, and wherein the cored-out section extends a distance from the trailing edge towards the leading edge.

10. The assembly as recited in claim 9 wherein the solid section extends along the first axial surface from the leading edge to a position adjacent the opening in the second axial surface, and the solid section extends along the second axial surface from the opening to the trailing edge.

11. The assembly as recited in claim 10 wherein the cored-out section extends along the first axial surface from a positioned adjacent the trailing edge to a position adjacent the opening in the second axial surface, and the cored-out section extends along the second axial surface from the leading edge to a position adjacent the opening.

12. The assembly as recited in claim 10 wherein the first axial surface solid section occupies at least 50 percent of the surface area of the vane first axial surface as measured between the leading and trailing edges.

13. The assembly as recited in claim 9 wherein the actuating means is a tab that projects outwardly from the vane, and the cooperating means is a slot.